



BR650D20(AU)

Product Specification

SPECIFICATION
FOR
APPROVAL

Title	65.0" WUXGA TFT LCD
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BUYER	
MODEL	BR650D20
SUFFIX	AU



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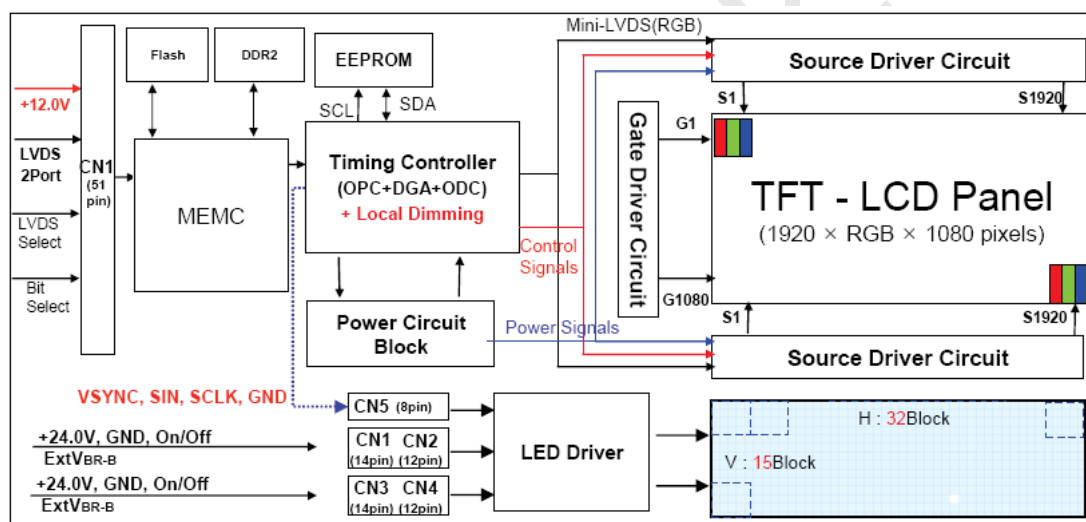
1. General Description

The BR650D20 is a Color Active Matrix Liquid Crystal Display with an integral Light Emitting Diode (LED) backlight system. The matrix employs a-Si Thin Film Transistor as the active element.

It is a transmissive type display operating in the normally black mode. This TFT-LCD has a 64.5 inch diagonal measured active display area with WUXGA resolution(1080 vertical by 1920 horizontal pixel array) Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes.

Gray scale or the brightness of the sub-pixel color is determined with a 10-bit gray scale signal for each dot, thus, presenting a palette of more than 1.06 Billion colors.

It is intended to support Public Display where high brightness,super wide viewing angle,high color gamut,high color depth and fast response time are important.



General Features

Active screen size	64.53 inch (1639.06mm) diagonal		
Outline Dimension	1508.0(H) x 878.0(V) x 60.0(D) mm(Typ.)		
Active Area	1428.48(H) x 803.52(V) mm		
Pixel Pitch	0.744 mm x 0.744 mm		
Pixel Format	1920 horiz. by 1080 vert. Pixels. RGB stripe arrangement		
Display Colors	10bit 1.06Billion colors		
Luminance, white	2000 cd/m2(Typ. Center 1 point)		
Power Consumption	938.64 W	Watts(Typ.) (PDD=8.64W PBL=930W)	
Weight	35Kg (Typ.)		
Display operating mode	Transmissive mode, normally black		
Surface treatments	Hard coating (3H), Anti-glare treatment of the front polarizer		



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2. Absolute maximum ratings

The following are maximum values which, if exceeded, may cause faulty operation or damage to the unit.

Table 1. Absolute Maximum Ratings

Parameter	Symbol	Values		Units	Notes
		Min	Max		
Power Supply Input Voltage	V _{CC}	-0.3	+14.0	V _{dc}	At 25 °C
Operating Temperature	T _{OP}	0	+50	°C	1
Storage Temperature	T _{ST}	-20	+60	°C	1
Operating Ambient Humidity	H _{OP}	10	+90	%RH	1
Storage Humidity	H _{ST}	10	+90	%RH	1

Note : 1. Temperature and relative humidity range are shown in the figure below.
Wet bulb temperature should be 39 °C Max, and no condensation of water.

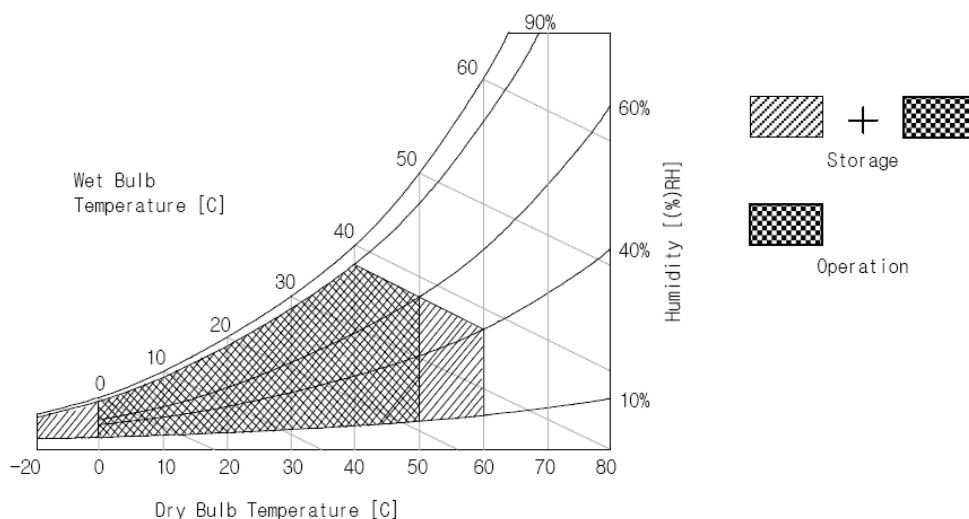


Figure 2. Temperature and relative humidity



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3. Electrical specifications

3-1. Electrical characteristics

The BR650D20 requires two power inputs. One is employed to power the LCD electronics and to drive the TFT array and liquid crystal. Another which powers the LED Backlight .LED Driver is an internal unit to the LCD.

Table 2. Electrical Characteristics

Parameter	Symbol	Values			Units	Notes
		Min	Type	Max		
Power Supply Input Voltage	V _{CC}	10.8	12.0	13.2	V	
Permissive Power Input Ripple	V _{RF}	-	-	0.1	V	
Power Supply Input Current	I _{CC}	0.4	0.6	0.8	A	1
Power Consumption	P _C	5.28	7.2	8.64	Watts	
In Rush Current	I _{RUSH}	-	-	16	A	2
LED Power supply Voltage	V _{BL}	22.8	24	-	V	3
LED Power Supply current	I _{BL}	-	38.7	-	A	
LED BL Power Consumption	P _{BL}	-	930	-	Watts	4
Brightness Adjust	V _{BR-B}	10	-	100	%	On Duty
Linear Brightness Adjust	V _{BR-A}	0	-	3.3	V	
Life Time		50,000			Hrs	5

Note: Do not attach a conducting tape to lamp connecting wire. If the lamp wire attach to conducting tape TFT-LCD Module have a low luminance.

- 1.The specified current and power consumption are under the V_{CC}=12.0V, 25°C, f_v (frame frequency)=60Hz condition.
- 2.The duration of rush current is about 2ms. And V_{CC} rise time is 500us ± 20%.
- 3.Operating voltage is measured under 25°C.
- 4.The LED Backlight power consumption shown above include LED Diver Module under 25°C.
- 5.The life time is determined as the time at which brightness of lamp is 50% compared to that of initial value at the typical lamp current on condition of continuous operating at 25°C.



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3-2. Interface Connections

LED BackLight Driver 14pin connectors is shown in the table 4.

Table 3. Module connector pin configuration

PIN #	Signal Name	Description	Note
1	V _{CC}	Operating Voltage Supply, +12V DC Regulated	Power
2	V _{CC}	Operating Voltage Supply, +12V DC Regulated	
3	V _{CC}	Operating Voltage Supply, +12V DC Regulated	
4	V _{CC}	Operating Voltage Supply, +12V DC Regulated	
5	V _{CC}	Operating Voltage Supply, +12V DC Regulated	
6	GND	Ground	
7	GND	Ground	
8	GND	Ground	
9	GND	Ground	
10	R1_0-	LVDS Channel 1, Signal 0-	LVDS Channel 1
11	R1_0+	LVDS Channel 1, Signal 0+	
12	R1_1-	LVDS Channel 1, Signal 1-	
13	R1_1+	LVDS Channel 1, Signal 1+	
14	R1_2-	LVDS Channel 1, Signal 2-	
15	R1_2+	LVDS Channel 1, Signal 2+	
16	GND	Ground	
17	R1_CLK-	LVDS Channel 1, Clock -	
18	R1_CLK+	LVDS Channel 1, Clock +	
19	GND	Ground	
20	R1_3-	LVDS Channel 1, Signal 3-	
21	R1_3+	LVDS Channel 1, Signal 3+	
22	R1_4-	LVDS Channel 1, Signal 4-	
23	R1_4+	LVDS Channel 1, Signal 4+	
24	GND	Ground	
25	R3_0-	LVDS Channel 3, Signal 0-	LVDS Channel 3
26	R3_0+	LVDS Channel 3, Signal 0+	
27	R3_1-	LVDS Channel 3, Signal 1-	
28	R3_1+	LVDS Channel 3, Signal 1+	
29	R3_2-	LVDS Channel 3, Signal 2-	
30	R3_2+	LVDS Channel 3, Signal 2+	
31	GND	Ground	
32	R3_CLK-	LVDS Channel 3, Clock -	
33	R3_CLK+	LVDS Channel 3, Clock +	
34	GND	Ground	



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PIN #	Signal Name	Description	Note
35	R3_3-	LVDS Channel 3, Signal 3-	LVDS Channel 3
36	R3_3+	LVDS Channel 3, Signal 3+	
37	R3_4-	LVDS Channel 3, Signal 4-	
38	R3_4+	LVDS Channel 3, Signal 4+	
39	GND	Ground	
40	NC	No Connect (AUO Internal Use Only)	
41	NC	No Connect (AUO Internal Use Only)	

◆ LCD LVDS connector (51pin): JAE FI-RE51S-HF

PIN #	Signal Name	Description	Note
1	V _{CC}	Operating Voltage Supply, +12V DC Regulated	Power
2	V _{CC}	Operating Voltage Supply, +12V DC Regulated	
3	V _{CC}	Operating Voltage Supply, +12V DC Regulated	
4	V _{CC}	Operating Voltage Supply, +12V DC Regulated	
5	V _{CC}	Operating Voltage Supply, +12V DC Regulated	
6	GND	Ground	
7	GND	Ground	
8	GND	Ground	
9	GND	Ground	
10	R2_0-	LVDS Channel 2, Signal 0-	LVDS Channel 2
11	R2_0+	LVDS Channel 2, Signal 0+	
12	R2_1-	LVDS Channel 2, Signal 1-	
13	R2_1+	LVDS Channel 2, Signal 1+	
14	R2_2-	LVDS Channel 2, Signal 2-	
15	R2_2+	LVDS Channel 2, Signal 2+	
16	GND	Ground	
17	R2_CLK-	LVDS Channel 2, Clock -	
18	R2_CLK+	LVDS Channel 2, Clock +	
19	GND	Ground	
20	R2_3-	LVDS Channel 2, Signal 3-	
21	R2_3+	LVDS Channel 2, Signal 3+	
22	R2_4-	LVDS Channel 2, Signal 4-	
23	R2_4+	LVDS Channel 2, Signal 4+	
24	GND	Ground	

Notes:

- 1.All GND(ground) pins should be connected together and should also be connected to the LCD's metal frame.



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2.All VCC(power input) pins should be connected together.

3.All NC pins should be separated from other signal or power.

Table 4. LED Backlight Driver connector pin configuration

Pin No	Symbol	Description	Board A (CN1101) Board B (CN2101)	Board A (CN1106) Board B (CN2106)	Note
1	VBL	Power Supply +24.0V	VBL	VBL	
2	VBL	Power Supply +24.0V	VBL	VBL	
3	VBL	Power Supply +24.0V	VBL	VBL	
4	VBL	Power Supply +24.0V	VBL	VBL	
5	VBL	Power Supply +24.0V	VBL	VBL	
6	GND	Backlight Ground	GND	GND	1
7	GND	Backlight Ground	GND	GND	
8	GND	Backlight Ground	GND	GND	
9	GND	Backlight Ground	GND	GND	
10	GND	Backlight Ground	GND	GND	
11	NC	No connection	OPEN or GND	Don't Care	
12	VON/OFF	Backlight ON/OFF control	VON/OFF	Don't Care	
13	EXTVBR-B	External PWM	EXTVBR-B		2
14	GND	Backlight Ground	GND		3

Notes:

1. The backlight ground should be common with LCD metal frame.

2. This Pin support Linear Dim Voltage control brightness.

Voltage	Function	Voltage	Function
0V	Minimum Duty (10%)	3.3V	Maximum Duty (100%)

3. #14 pin Must be Connected to GND.



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3-3. Power Sequence

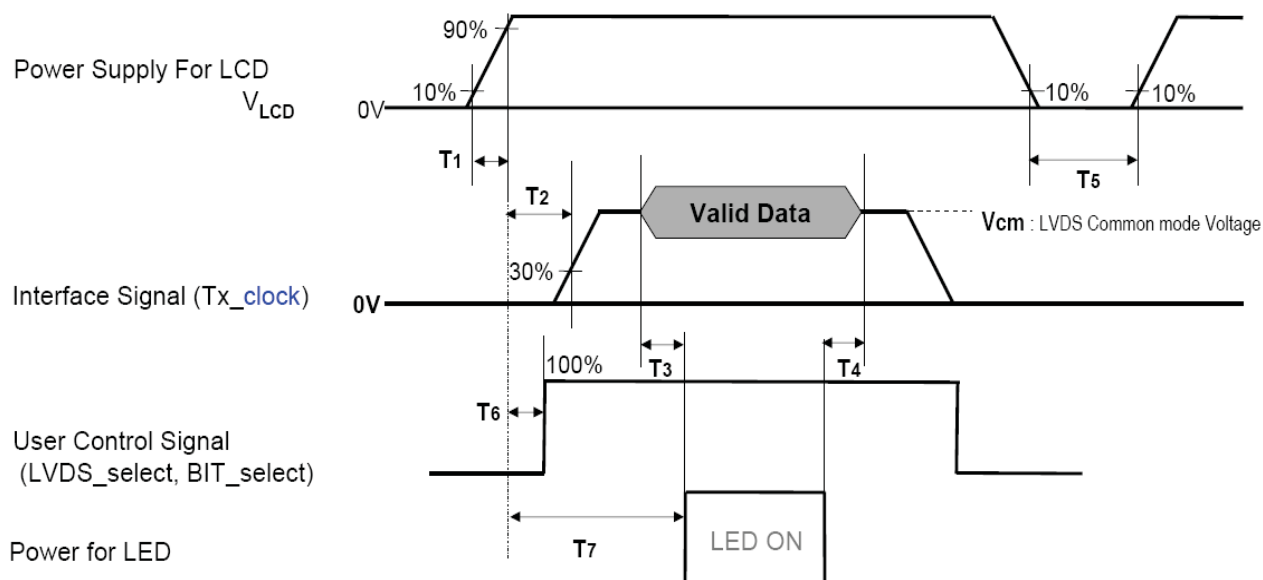


Table 5. Power sequence time delay

Parameter	Values			Units
	Min	Type	Max	
T1	0.4	-	30	ms
T2	0.1	-	50	ms
T3	300	-	-	ms
T4	10	-	-	ms
T5	0.5	-	T2	s
T6	-	-	-	ms
T7	0.5	-	-	s

Notes:

1. Please avoid floating state of interface signal at invalid period.
2. When the interface signal is invalid, be sure to pull down the power supply for LCD VCC to 0V.
3. Lamp power must be turn on after power supply for LCD and interface signals are valid.

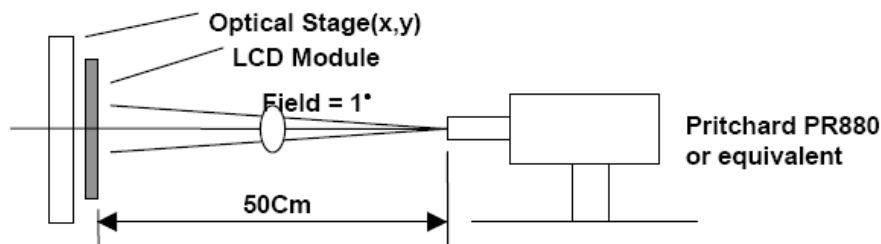


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4. Optical Specifications

Optical characteristics are determined after the unit has been 'ON' and stable for approximately 30 minutes in a dark environment at 25 °C. The values specified are measured at an approximate distance 50cm from the LCD surface at a viewing angle 0 °.



[Figure 9] Optical characteristic measurement equipment and method

Table 6. Optical characteristics

Parameter	Symbol	Values			Units
		Min	Type	Max	
Contrast ratio	CR	4000	5000	-	
Surface luminance, white	L _{WH}	1850	2000	-	cd/m2
White luminance uniformity	ΔY	80	85	-	%
Response time	G to G	-	5.5	-	ms
Color Temperature			10000		K
Color Gamut(NTSC %)			72		%
Viewing angle (by CR >10)	x axis, right($\phi = 0^\circ$)	-	89	-	degree
	x axis, left ($\phi = 180^\circ$)	-	89	-	
	y axis, up ($\phi = 90^\circ$)	-	89	-	
	y axis, down ($\phi = 270^\circ$)	-	89	-	

Notes:

1. Contrast Ratio(CR) is defined mathematically as :

CR = Surface Luminance at all white pixels / Surface Luminance at all black pixels

It is measured at center 1-point.

2. Surface luminance is determined after the unit has been 'ON' and 1 Hour after lighting the backlight in a dark environment at $25 \pm 2^\circ$ C. Surface luminance is the luminance value at center 1-point across the LCD surface 50cm from the surface with all pixels displaying L255 white.

3. The White luminance uniformity on LCD surface is then expressed as :

$\Delta Y = (\text{Minimum Luminance of 9 points} / \text{Maximum Luminance of 9 points}) * 100$



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5. Mechanical Characteristics

Table 7. provides general mechanical characteristics for the model BR650D20. Please refer to Figure 15,16 regarding the detailed mechanical drawing of the LCD.

Table 7. Mechanical characteristics

Outside dimensions	Horizontal	1508.0mm
	Vertical	878.0mm
	Depth	60.0mm
Active display area	Horizontal	1428.48mm
	Vertical	803.52mm
Weight(approximate)	35Kg(Typ.), 35.5Kg(Max.)	
Surface Treatment	Hard coating(3H) Anti-glare treatment of the front polarizer	